

Testing Ryan's shit

Blah, blah blah (see van Zwanenberg and Millstone 2000) and blah blah (Wright, Yeoman, and Hale 1978, p.33).

Also see (Beyer, Beck, and Lewandowski 2011, p.211)

{Contextual} Weeding has typically been described in advertisements as time consuming, dull, back breaking work that spoils leisurely or creatively enjoying the garden, even if some gardeners confess to finding weeding meditative or a productive use of time in the garden. For those who would rather speed up the task, make it more comfortable, or simply deploy signs of technological progress, a market has developed for mechanical and chemical aids to this chore. Quite often in these adverts and articles, war is invoked and a battle scene between the gardener and the weed, or the weed and the gardener's choice of plants, is set out.

Development of Paraquat

"Paraquat is the B.S.I. [British Standards Institution] common name of the cation 1,1'-dimethyl-4,4'-bipyridylium, which is available as the dichloride of the di(methyl sulphate)." This is the formal description of the herbicide paraquat, which was characterised, tested and formulated by Plant Protection Limited, a subsidiary of Imperial Chemical Industries. The chemical's herbicidal potential was first observed in 1947 and work started in earnest on paraquat from 1955. An agricultural paraquat product, Gramoxone W, was put on the market in 1962, followed in 1965 by Weedol for amateur gardeners. This chapter looks at the development of paraquat as a herbicide, its reception in Britain, and how some users were determined to ignore the categories set by the product makers.

Why was there such a delay - was it the war, was it that they were working on something else, it couldn't have just been the geographic distance? Where would I find this out? Maybe Catalyst's archives?

Paraquat is rapidly inactivated by contact with the soil, which dampened enthusiasm raised by its unusual herbicidal strength. Recently developed weedkillers on the market such as Fison's simazine were used to suppress weed growth by remaining active in the soil for months. Chemist William (Bill) Boon viewed inactivation as a useful property and persuaded his reluctant colleagues that paraquat was worth developing.

Mechanism of action section A contact herbicide, absorbed through the leaves paraquat disrupts photosynthesis

Company history section When intense work started on the quaternary salts that would yield paraquat and the closely related diquat **introduce the chemicals more thoroughly earlier**, Plant Protection Limited was jointly owned by ICI, and Cooper McDougal and Robinson but changes would take place before

any products reached the market. Cooper McDougal and Robinson had been established in the crop protection business longer than ICI, and in 1937 when ICI started to work in this area, Plant Protection was formed as an attempt to prevent intellectual and sales territories being encroached and allow networks of contacts to be taken advantage of. Chemicals which were synthesised both at ICI's Dyestuffs division and their General Chemicals division, respectively based in Blackley in Lancashire and at Runcorn in Cheshire, were then sent for field testing and development at the Plant Protection facilities, Jealott's Hill and Fernhurst, in Kent. The geographic separation of chemists from the biologists and agriculturalists slowed exchanges and in 1954 a team of five chemists, including William Boon, moved south to be permanently based at Jealott's Hill.

In 1959, the year that the first 50lb batch paraquat was made it was evident that the crop protection business was losing money and became the subject of a restructure. Plant Protection became wholly owned by ICI, who realised how much they had been subsidising the business. Redundancies followed, with most of the cuts at Fernhurst, though Jealott's Hill also felt the effect, resulting in a certain amount of bitterness and disruption. [ref Jealott's Hill book here, see notebook]

Paraquat was developed during this transitionary and potentially disruptive period. That commercial products reached the market in 1962 shows the commitment of those involved, though stemming the drain of money and generating income must have been strong motivators. That first 50lb batch cost £50 000 and for the development of the herbicide to go ahead, a much more economic method had to be found. Mond division eventually developed a financially viable process for the manufacture of paraquat, which was also "so complex that it assured a virtual monopoly of manufacture" [Kennedy, p146]. **find patent details to back this up**

testing paraquat, in relation to toxicity and legislation In addition to efficacy at the intended purpose of the weedkiller, safety tests had to be carried out before the new herbicide could be marketed. These took the form of acute and chronic toxicity tests on rats. Over time these were supplemented with observations from real use scenarios or investigations triggered by real world questions, such as the time vegetation should be left before animals could eat it.

In a report written by Plant Protection about Weedol 1964, they stated that "there are no particular clinical tests of symptoms applicable to poisoning with this product. In case of gross contamination normal first aid measures should be used." Their cautions to the user on the draft label were "For use only as a garden herbicide. Store in a safe place. Safely dispose of empty container. Keep off skin. Avoid inhaling spray. Harmful to animals. Wash utensils thoroughly after use. Store safely, away from children." [MAF 284/289 15A, {IMG 3030}] These are very similar to the warnings given to the users of the concentrated form, other than that also included instructions not to repack.

No tests of symptoms - symptoms of poisoning were usually provided in tables or

list forms in first aid guides and household management manuals. These described what the first aider should notice, such as sleepiness, bottles of household chemical or medicines and help them to choose an appropriate action such as encouraging vomiting, or drinking milk, water, coffee. It is true that paraquat didn't burn, like corrosive fluids, didn't necessarily cause vomiting, so this statement is indeed true. There were clinical tests, such as detecting paraquat in urine or blood, using colorimetric tests, and this method was used to quantify exposure during spraying by agricultural workers, by measuring the absorption and excretion of paraquat. These tests could establish the presence of paraquat in a poisoning victim, so it was not a method of killing that could go undetected but these were not routine tests to do and there were instances where the victim was hospitalised for weeks before this kind of test was run. Pathological tests showed changes in the lungs, which were characteristic of paraquat.

beyond killing weeds- farming In paraquat's properties Boon saw the potential for, and with the teams of researchers at Plant Protection developed, not just a herbicide, but completely new systems of arable farming and pasture regeneration. A grassland consultant had previously complained to Boon about ploughing burying and therefore killing the fertility of the soil. Boon thought a herbicide that left a mulch of dead vegetation on the surface could help retain moisture and protect the soil from wind, both would prevent soil erosion. Soil erosion might not have been of concern to many British farmers, but in export markets such as the Russia [ICI success at Moscow fair 19.05.64, The Times, p18 and SOS from Russia], this attention to benefits could help enhance sales/ choose the product. The potential to avoid or reduce ploughing was the concept behind ICI's promises that paraquat would revolutionise farming, although the chemical plough idea only started to be fully tested from 1962, the year it became generally available to agriculturalists and horticulturalists. Researchers and engineers spent the following eight years developing machinery to allow seeds to be planted with minimal ploughing. They were able to demonstrate successful pasture rehabilitation by an impressive weight gain for lambs grazed on a field treated with their method which showed the improved nutritional quality of the grass. [ref Kennedy or Jealotts Hill book] also [How I transformed my pasture without the plough and got a higher milk yield, The Times, some kind of supplement p.ii, 07.12.64 and How I turned a problem field into productive pasture, The Times, some kind of supplement p.v 07.07.64]

These new methods of using a weedkiller were not fully articulated or tested when Gramoxone was launched, but this extra layer of value or uses beyond effective weed control was a promise that ICI proclaimed from the beginning [Improved Type of Weed Killer, The Times, p 10, 23.08.62 and Farewell to the plough, Winter, J., Daily Mail 29.08.62,]. The articles that appeared in newspaper farming columns can reasonably be judged to have been initiated by promotional material, either a brochure or press release, from Plant Protection and to relay information about the potential uses, rather than to arrive at original ideas. **would Catalyst have any of the original promotional material that would show this?**

Despite hyperbolic stories in the press about farms being deserted thanks to the chemical plough [Where have all the workers gone? P. Bullen, Daily Mail, 22.04.66], the direct drilling method was slow to be adopted, possibly because of the need for new expensive (and not fully reliable) equipment that could plant seed directly into the ground[].

communicating about paraquat Gramoxone was not intended for use to the general public, so it might be expected that adverts for this agricultural product would not to be placed outside specialist publications. There were exceptions to this assumption. The Times ran a couple of case study/ testimonial ICI adverts for Gramoxone in what I imagine to be a farming supplement in 1963 and 1964. ICI would not pay for their advert to be placed somewhere they didn't think it would pay off for them, so The Times must have allowed them to present their products, and associated practices, to farmers or decision makers who were known to be amongst the readers. Perhaps advertising here was even a good investment to publicly show ICI shareholders what they were doing.

In 1964 ICI placed a more general educational advert in main body of the The Times entitled "Research, The Springboard of Progress" about the benefits of selected ICI products: Gramoxone, leprosy treatment and wipeable wallpaper. Educational adverts were a staple feature of ICI's communication with the general public about their work and public relations for the chemical industry in general. ICI's underlying promise was that paraquat would boost the nation's total area of productive land, and when exported overseas was set to guarantee riches to the UK's chemical industry. In post-war Britain which was rebuilding its economy, this was an encouraging message. Later, as the United Kingdom suffered in a recession in the 1970s, ICI could again call on paraquat to demonstrate the contributions of the company to every day life, and the British economy. "Ideas in Action from ICI" was placed in the Daily Mail in 1974 which showcased more of their revolutionary products, with Gramoxone being first on the list, followed by "the world's most widely used anaesthetic" and 'BCF' liquified gas to put out fires "saving precious seconds, precious lives." In this advert, which was part of a series, their message was summed up "Changes for the better, world wide". In addition, ICI spelled out how much money the company was making, investing and recirculating through using "35 000 suppliers" in the UK, which seems to be an effort to show the company in a positive light when the country was in recession.

communicating about paraquat - safety Gramoxone had a concentration of active ingredient paraquat at 20%. The herbicide arrived with users as a brown liquid and among the warnings about avoiding contact with skin and eyes, there were instructions that as a condition of sale, it should not be repacked from the original containers. **something about application, drift and vibro-bar?**

The concept of chemical persistence would shortly become raised in public awareness through Rachel Carson's *Silent Spring* published in the United States in 1962. Agrochemicals that remained detectable (never mind active) in the soil, on foods as residue, in water and shown to accumulate in animal food chains

over a long period of time were all imbued with the potential for unknown, damaging, long term effects like those of DDT. An unusually effective chemical that was proved to be quickly, and naturally (that is without the addition of any other manufactured products) rendered harmless in the soil would have been an attractive option for marketing to large scale users and home gardeners alike after the desolate visions that Carson conjured up (PURE SPECULATION BASED ON DATES, NO EVIDENCE IN ARCHIVES SO FAR AND SUSPECT UNLIKELY, POSSIBLY COULD GET MENTIONED TANGENTIALLY IN ORAL HISTORY). Times article here - re. persistence

Gramoxone was never intended for home use and over the next three years scientists and technologists (researchers?) at Plant Protection continued work formulating, testing and seeking approval for a less concentrated paraquat-based weedkiller for domestic or amateur gardeners. Paraquat, the active ingredient, was only 5% instead of 20% as it was in Gramoxone. Plant Protection branded it Weedol, a much more descriptive and potentially user friendly name than Gramoxone **What do the names Gramoxone, and Gramanol, communicate to ag/ind users?**, and this weaker version was marketed widely from 1965. This descriptive name was confusing similar to Fison's long acting, total weedkiller based on simazine which had been on the market since 1959, Weedex. [...and in the Toolshed' A Correspondent, Times, 23.04.66, p13 and 'Know your Killers!' MacKinnon, CA, The Daily Mail, 06.05.67, p9, gardening columns]

harmless - see adverts

Plant Protection were resistant to suggestions that the word "Poison" should be included on the label, preferring the alternative wording "Not to be taken" and "Harmful if taken" or "Dangerous if swallowed" which are really not as hard hitting. They maintained that when users followed the instructions, the product was safe. Plant Protection compiled details of incidents and compared their frequency to the amount of Gramoxone used annually showing perhaps one accidental death and one suicide each year from 1966. They blamed the relatively high number of deaths in Ireland when considered in relation to the amount of Gramoxone used, on small scale users of agricultural chemical and the custom of taking any container to get filled with whatever substance, and this practice did not take place England, Wales and Scotland.

Roy Hay, Times gardening columnist took care to specify Weedol whenever he discussed using paraquat. This followed readers writing to question why he recommended it, following the death of Beverly Pollitt, the first accidental death reported in the paper which immediately named paraquat (Stornoway was "weedkiller" until later in proceedings). Even though he did not religiously do so, he did it frequently enough that regular garden column readers would have encountere

7 million 1oz tubes of formulation were sold while Weedol had provisional commercial clearance, which was treated as a time to make observations of the real life use scenarios. It was sold as packets of granules or pellets, where

the whole 2 ounce packet was to be dissolved directly in a 2 gallon watering can. **check weight - was it 2 or 1oz?** This meant that the user should not have to measure out or handle the product, as well as there being no left over granules to store, and the whole liquid amount used up. From the product launch in 1965 to May 1967 there were 8 reported medical incidents involving Weedol. Three were attempted suicides, one was a child eating the granules “who should not have access to the preparation” and four arose “during application of the chemical and resulted from carelessness”. By “attempted” suicide, we infer that they were not successful, the child was not fatally poisoned and there is no detail on the extent of any of the “careless” weeders injuries. [Fifth report on paraquat - Home Garden Use, MAF 284 307, doc 108 {IMG_2917}].

When Weedol was sent out with Plant Protection staff for testing at home, this single use sachet raised questions about the size of commonly owned watering cans, and thus what could reasonably be expected to give reliable results. They had ruled out a domestic product based on diquat, because there was a tendency for test animals to develop cataracts making paraquat appear to be the better option. In the 1970s, diquat was incorporated into a new improved version of Weedol [WAS THERE ANY COMMENT ON THIS? I CAN'T REMEMBER THAT CATARACT WAS BROUGHT UP AGAIN, OR WHETHER IT WAS JUST TO REDUCE THE PARAQUAT BUT KEEP THE EFFICIENCY]

communicating about paraquat - accidents Perhaps inevitably, Gramoxone was repacked into drinks bottles and from 1966 accidents started be reported. Plant Protection and regulatory committees were interested in collecting information about all kinds of accidents, whether from skin contact so that sales restrictions and printed warnings could be examined to see how well they worked and if they needed amending. Crofters and other small scale agricultural users, especially in Ireland, were identified by Plant Protection as a population of users who were particularly prone to buying small amounts of agricultural chemicals in reused containers such as drinks bottles and were accordingly disproportionately accidentally poisoned [findref]. It impressed workers whose job it was to clear unwanted vegetation - agricultural workers, council workers, people maintaining runways and railways - and, disregarding whether they had permission or not, they took it home for themselves or friends to use. The familiar shapes of drinks bottles, an important part of their brand identity, sent out the wrong signals about safe contents when they were reused to store agrochemicals. The bottles of concentrated herbicide found their way into bags, glove compartments, sheds, kitchens and even fridges where they were mistaken for dark coloured drinks: cola[ref], Ribena,[ref] stout [ref] then swigged by curious or thirsty children, teens and adults, with very serious and sad consequences. When drunk, paraquat could be quickly absorbed into the blood, with pathologists warning that a mouthful could be lethal even if it was spat out [“Weedkiller was nice, dying child whispered” The Times, 19.07.72, p2], or speculating that a graze on a child’s knee could be an entry point for a fatal dose if they played in a recent sprayed field [The boy who thought he’d had a drink of pop, Jane Gaskell, The Daily Mail, 24.06.71, p6.] although I did not find any reported cases of this

happening.

As well as irritating and ulcerating the mouth and throat, paraquat has a peculiar effect on lung tissue in particular, irritating and thickening the membranes that gas exchange occurs across, reducing the efficiency of the organ, but also causing cell proliferation in the lungs which thicken so much that the lungs solidify, pulmonary fibrosis. Despite doctors' best efforts to deactivate paraquat with Fullers earth, or kaolin mimicking the deactivation seen in soils, or to dilute the chemical in the bloodstream through forced diuresis as was successful in treating barbiturate overdoses, in the early days of gramoxone poisonings it was a horrifyingly certain and slow death, potentially over two weeks or more. In September 1967, an editorial in the BMJ preceded an account of an "unusual" suicide by injection of concentrated paraquat, which took place in Israel and was not reported in mainstream UK newspapers. In this editorial, attention is drawn to the UK case of a child sent home who had appeared to have recovered from accidental paraquat poisoning, but died two weeks later. It is interesting to see the medical profession faced with this new chemical, sharing information and trying to learn how to deal with it to best treat the patient as well as protect their profession. Special care is taken to ascertain from the patient what kind of weedkiller it was, implicitly highlighting that doctors need to think beyond what worked for arsenic based weedkillers or other poisons which might not necessarily be appropriate in this situation. Readers are urged to consider the possibility of renal failure, as well as delayed development of fibrosis with an eye to these apparent early recoveries, which shows that the potential for effects to catch medical staff out who are not up to date with the newest chemicals available. It also puts expert medical technologies, dialysis, at the forefront of this [Poisoning from Paraquat BMJ, Vol 3, No 5567, 16.09.67, p690-691. As more literature accumulated on treating these poisonings, medical staff had a better idea of what they were dealing with and what the relationships were between dose ingested, or absorbed through the skin, and outcome, as there were many who didn't take a fatal dose, especially if they took the granular preparations, and that providing they were rehydrated they wouldn't suffer renal damage. It is telling that in 1987, once the dose has been established as being in the severe bracket the advice is to focus on palliative care and supporting the patient and their family towards the end of life [Vale et al, 1987].

When Plant Protection were trying to get clearance from the Advisory Committee on Poisonous Substances Used in Agriculture and Food Storage in 1962, they presented results from acute and chronic LD50 tests on rats, rabbits and a small sample of hens. Disruption of finger nail growth and nosebleeds in staff packing the chemical had also been observed, explained away by improving the use of gloves and better ventilation. A variety of possible mechanisms were discussed by the scientists on the committee and Plant Protection representatives, but why animals died and why ICI workers had been affected in that way was not known. The benefits of the chemical seemed to outweigh the potential problems, problems that could be avoided if sensible precautions were taken.

However, it wasn't just the users who failed to adhere to the condition of sale that Gramoxone was not to be repacked, as in 1968 a case reported in a Cambridge newspaper told of a store that sold Gramoxone in a reused lemonade bottle, delivering it to the purchasers' doorstep. Luckily no-one was poisoned, but the chemist was found guilty of gross carelessness and fined. In 1967 Plant Protection sent what they called a "strongly worded letter" to its main agents and distributors reminding them about the dangers of selling Gramoxone that was not in its original container [MAF 284/307, 149, Letter from AAB Swan (Plant Protection Ltd) to F Stuart (Poisons Board) 16.02.68, National Archives, Kew].

Journalists remained objective in their reporting of accidental poisoning with Gramoxone, although they didn't mince words when they could be delivered from authority figures. William Boon, father of paraquat, was reported as attributing accidental deaths to "human stupidity". **findref**Keeping Gramoxone in unmarked, reused bottles was "asking for it", The Times reported coroner Donal Summerfield as saying. [Man drank weedkiller by mistake, The Times, 11.12.69, p.5] As poisonings of this type accumulated, a coroner was reported as frustratedly saying "when will the public learn?" [Girl drinks first and dies, Daily Mail, 30.09.72, p9], but the reporters at the paper remained objective, and did not expand or moralise on the subject of those who chose to use Gramoxone at home.

Despite fatal incidents occurring since 1966, the Daily Mail did not report on any until 1968. Before that date, stories about paraquat were limited to the farming, business or gardening columns, which only proclaimed the benefits of the herbicide. The front page news of Britain's, even Europe's, first lung transplant in 1968 is also one of 15 year old Alex Smith's accidental paraquat poisoning. Although the focus of the stories is of the surgical procedure, most papers mention an unnamed weedkiller, at least in the initial article. The Times initially reported weedkiller then in a later article, identified the herbicide as paraquat. In the series of articles following the transplant, The Mail did not name the weedkiller, but it is clearly gramoxone from the descriptions "looked like Coca Cola" and the effect on the lungs in particular [13.05.68 Boy and Girl in lung-swop operation, 18.05.68 Lung boy sits up for icecream, 29.05.68 Lung transplant boy dies All The Daily Mail, p1].

That same year, The Mail's farming column reported that the Essex branch National Farmers Union wanted the danger of the product to be emphasised on the label. This was the first time the Mail explicitly associated paraquat with fatal poisonings [Peter Bullen, Weedkiller Warning, p4 25.05.68]. A couple of months after this story, the paper reported on the death of a child who drank paraquat from a lemonade bottle - this story appeared in the general news [cannot find article? check the Kew photos]. Another article in the Farming column later that same year announced that liquid formulations of paraquat were going on the Home Office poisons list, but that Weedol was exempt [Killer chemical goes on Poisons List, Peter Bullen, 09.09.68 p6]

The BMJ article on the Alex's lung transplant (although he wasn't named in the article) noted that he "had no previous significant history and he was a well-balanced, intelligent, and stoic individual". It seems unusual for the character of a patient to be commented on in this way, as the newspapers tended not to include this type of adjectives. [Mattheyw et al, BMJ Vol 3, no 5621, pp 759-763 759] *should probably check some other BMJ articles to see whether this kind of comment was usual*

use graph There was a big rise in paraquat poisoning stories from 1971 and I speculated that the trigger for the Daily Mail to start reporting on deaths was not necessarily that they were becoming more frequent, but that they were no longer just affecting adult workers. This could not be the case, because we've seen examples of accidental weedkiller (which is plainly gramoxone) related deaths of children and teens being reported. The BMJ editorial demonstrates that children had been poisoned from 1967, or perhaps earlier, so perhaps it was a critical number of children or people affected in accidental poisonings. **Glen asks about how these child incidents were reported** *I haven't managed to find any analysis of journalism relating to children yet, but the stories as reported remained objective, not especially emotive, did not always use photos* Perhaps it was to do with a lack of clarity about regulations on sales, the presence of Weedol on the market and potential for domestic users to seek out paraquat and equate stronger with better, or just pure horror at how a chemical that could lead to such an agonising death could be so widely available. I need to do further research is needed to find out what this tipping point or change at the Daily Mail was.

Accidental poisonings as news items meant that paraquat left the confines of niche gardening, farming columns. These stories invariably conveyed the lack of effective treatment available, often with the stock phrase "no known antidote". Bill Boon noted that most chemicals didn't have a known antidote, in the true meaning of the word, and attributed this phrase to an answer given to a coroner in court to the question whether an antidote was available.

Newspaper articles at the start of the spate of accidental poisonings initially simply said weedkiller, which would be fair enough as swallowing any sort of weedkiller could be expected to have a life threatening effect. Then as the stories were elaborated on or became more numerous the identity of the weedkiller was presented. Each of these accidental poisonings could be attributed to the agricultural herbicide being taken from a workplace, some have said stolen, then stored and labelled inappropriately in a domestic environment. It was the chemical paraquat, rather than the brand name Gramoxone, that was held accountable. Only ICI made paraquat, they held the patents and it was a complicated process, so avoiding using the brand name but in naming paraquat, the company was implicitly named. The occasional use of the brand name disrupts the idea that papers might have been trying to protect themselves from the company. [Do newspapers have a responsibility of sorts to be honest rather than coy about this type of information?]

In 1972, marking ten years of paraquat on the market and six years since the first fatality, the Daily Mail took up the cause of accidental paraquat poisoning, focusing on the risk to children. The newspaper ran their own investigation into how easy it was to obtain Gramoxone and that controls on its retail were not working. Simultaneously, adverts in the Daily Mail for Weedol disappeared in 1972 and apart from one advert I found in 1975, did not appear again regularly until 1978, 6 years of turning down revenue.

The Daily Mail newspaper's active role in educating readers about the dangers of paraquat can be seen in the MAFF files, in the form of requests for information from their reporters. The files also show civil servants' reactions to articles from the Daily Mail and it shows them learning to anticipate what journalists would be asking for. There was a mixture of relief that the paper was getting across information about storing chemicals safely and following instructions for safe use, but also irritation that the journalists were misreporting and mangling other facts, even that they were appeared to be getting their information from sources other than MAFF.

Extensive reporting of accidental poisoning was educational because people became more aware of *why* they shouldn't decant industrial strength herbicide into unlabelled bottles, and what the consequences could be of asking a friend for a bit of the amazing weedkiller from their work.

communicating about paraquat - not accidents Perhaps another consequence of reporting fatalities from accidentally ingesting the chemical was that deliberate poisonings started to occur. In 1973 Dr Matthew of the Poisons Board blamed what he called "disproportionate" media coverage given to paraquat deaths for the fact that in Scotland, the number of accidental deaths from paraquat was overshadowed by the number of suicides with the chemical [Extract from minutes of 66th Meeting of the Poisons Board, held on 23.2.73, Paraquat PB 998 IMG_2643 - check Kew sequence to find file name]. Weedol featured in numerous para-suicides; the reports in medical journals of this uses of the domestic chemical do not state whether the user knowingly chose this weaker form as a signal of distress, or because they were unaware that the paraquat reported on in most news stories was actually the more potent form Gramoxone.

Paraquat was perhaps not a special case, as suicide relating to weedkillers in general not especially unusual. Michael Clarke pointed out in his study of suicides by poisoning, that as arsenic vermin killers were replaced on the shelves by nonarsenical formulations in the twentieth century, arsenical weedkillers became the method of choice of those determined to obtain arsenic for the purposes of self destruction. The arrival of a new herbicide also provided a new chemical to poison oneself with.

Murderous paraquat users were portrayed in the newspapers as adulterous, jealous men and women, in turbulent or unconventional relationships, who administered the weedkiller in sherry, in cups of tea or mixed into stews. These murders were described in salacious detail in the newspaper. In two separate

cases, the women even stated that she had got the idea from a story in the newspaper [DM reporter, “I’ll pole-axe you” a mother’s shout at murder case, 05.07.74, p13 and Roger Scot, Poison stew wife is jailed for life, 10.01.75, p3]. On this subject, newspapers remained quiet, despite the interesting question of their responsibility for copy-cat behaviour triggering.

This “Changes for the better, world wide” advert appeared one day before the Mail launched into nearly two weeks of daily court reports of a murder involving gramoxone. [I suggest that this is not a co-incidence. Would there be anything in the Widnes files? Also, why place it before, rather than after? Perhaps plant image of ICI and gramoxone in positive light before court case kicks off, stress that this form of paraquat is agricultural and really useful, rather than simply damage limitation/ recovery after]

This project is supposed to be about the users of chemicals, So, who were these people? MAFF described people who brought home Gramoxone from agricultural or horticultural stocks as trying to avoid the expense of buying Weedol [SW 1169, 182, PNM Moore documenting a telephone conversation with Holloway 26.6.68, National Archives, Kew]. From the circumstances reported in newspapers, liquid paraquat preparations tended to be brought home by quite young men, who worked in agricultural or horticultural jobs or were in social circles with people who could access the high concentration product. One of the accidents occurred in a static caravan park, not generally known for the wealth of their inhabitants.

ICI had imagined the user of Gramoxone to be an arable farmer or agricultural worker. Stating that it was not for general use, getting licences for a particular use, does not prevent it being used outside these stipulated situations. They must have known this would happen? Repeatedly stating that the product is safe when used as directed - are there any other examples of this?

Developing Weedol for use at home, which is a quarter of the strength of the agricultural product, demonstrates that the company accepted that the chemical was too dangerous to have in a domestic environment. [How is a domestic environment different to a working one?] Farms might ideally have procedures in place, such as locking away chemicals, the provision of protective equipment, payment appropriate to the risks, that prevented the misuse or dangerous use of agricultural chemicals? This profile does not match the image of users shown in the advertisements for Weedol [**show adverts**], which is a middle aged male, he has a little belly, this is his garden, he’s using it among flowers and shrubs - not to clear expanses of weeds in an industrialised setting, and he’s at leisure - he’s wearing a casual jumper, smoking a pipe.

Standing up to weeds is perhaps not war like, but it is sending dual message - that you don’t have to be beaten by weeds and you don’t have to be on your knees, you can stand up to weed. . . Again, it’s the man doing this task. Are women less inclined to use weedkillers? Are women supposed to be nurturing rather than killing? Maybe that’ll come through in oral history work or more

archival research.

We can see from these verbose, very informative if you take the time to read them -adverts that great pains were taken to put across the ease and simplicity of use, using the plants natural processes to kill the plant. There is no mention of the percentage of active ingredient. The product is not related in any way to gramoxone by these adverts, but equally no attempt is made to distinguish it from it. In a way, ICI needed the success of the agricultural chemical to get domestic users to seek out paraquat based products. We can just about see some of the precautions, and restrictions - here is says only use as a garden weedkiller.

Vale et al describe in 1987 that paraquat itself causes nausea vomiting and diarrhoea due to its irritation of the gut. In addition, all recent formulations contain an emetic, PP796, a phosphodiesterase inhibitor to directly stimulate the vomiting centre. Granular preparations (Weedol, Pathclear) contain magnesium sulphate, stimulating diarrhoea. These changes to formulation were made to try to eliminate the chemical from the system of the person who had consumed it *need to find out when.*

Wrapping Up

I have shown that Paraquat was enthusiastically received by niche newspaper columns. Gramoxone, although never intended by the manufacturers for domestic use *was* invited into some private homes and gardens, sometimes resulting in fatal poisoning. Deaths relating to paraquat were recorded from 1966, a year after Weedol was widely marketed to home gardeners. The Daily Mail promoted the benefits of paraquat products and advertised Weedol. Unintended uses of paraquat based herbicides brought the chemical to wider attention and media reports of these unintended uses contributed to these uses being perpetuated.

I thought it was interesting where poisonings were reported in the newspaper the chemical name, paraquat, was generally held accountable, rather than the brand names of the paraquat products. A critical point was reached in 1971, possibly the total number of fatalities, where that newspaper seemed to take up an educational role communicating the full dangers of paraquat to potential users and even existing users. This was possibly because ICI preferred to focus only on the adherence to their instructions for safe use and not give details of the consequences of not following their precautions.

While the Daily Mail was running a lot of stories about paraquat related deaths, they stopped advertising Weedol which had been seen regularly in the paper from 1966 until 1970. In Weedol adverts that depicted a user, this imagined user did not match the image of those who chose to bring the stronger version home.

John Timbrell, a toxicology textbook writer, included paraquat in his stab at writing a popular science book about chemicals. It is unclear what sources he examined as there is not a complete bibliography, but he appears to have been confused about the origin of paraquat in his victims of poisoning, accidental or otherwise. He blamed Weedol for many incidents that were related to Gramoxone

and reworded and misapplied descriptions that were originally of Gramoxone (being mistaken for Cola) as being mistaken for fizzy drink. During the height of main stream news reporting on paraquat poisonings, this kind of confusion is very rare. Even in parliamentary debates, speakers tend to be corrected quite quickly. Here there are a number of lords and MPs who come from farming backgrounds, or are still actively farming, so appreciate the value of effective weed control and the need to follow instructions carefully.

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